

**Abstract**

An electromagnetic ultrasonic transducer for coupling-media-free generation and/or reception of ultrasonic waves in the form of linearly polarized transverse waves in and from a workpiece is disclosed, having at least one unit which converts the ultrasonic waves inside the workpiece and which is provided with a coil for generating, and/or detecting a high-frequency magnetic field and premagnetizing unit for generating a quasi-static magnetic field which superimposes the high-frequency magnetic field in the workpiece. The coil is disposed in a torus-shape on at least one partially toroidal or U-shaped magnetic core, having two front ends which can be turned to face the workpiece. The front ends of the magnetic core, which can be turned to face the workpiece, are connected directly or indirectly to a magnetic flux piece which has a surface facing the workpiece and connecting the front ends with each other.